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From a systems analysis viewpoint, an evaluation system is a subsystem that is superimposed on the educational system to provide information for decisions related to its maintenance and goals. Educational outcomes, viewed as a much broader concept than the traditional view of changes in pupil behavior, represent the starting point for any evaluation activity in education. To evaluate an instructional program in terms of all of its significant interactions, an evaluation strategy (plan) is required which systematically provides information concerning both (1) input and output changes caused by related subsystems and (2) output changes caused by alterations of the system under consideration. (JH)

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THE ROLE OF EDUCATIONAL OUTCOMES IN EVALUATION STRATEGY

Walter J. Foley

In order to clarify the role of educational outcomes in evaluation strategy, it is first necessary to detail what is meant by a strategy. The fact that an evaluation strategy is necessary has never been clearer in American education. We are faced with an unprecedented challenge-the challenge of providing an alternative to social chaos. Our public and our patrons are looking to education as never before to provide stabilization in these times of crisis. We are caught on the horns of a dilemma. At the same time that technological change has forced us to reexamine the basis for our teaching relationships, mass social changes have forced us to consider what we are doing to the students in our system--to examine the very process of education as it exists today.

To better understand the need for an evaluation strategy, let us make a slight detour and consider two kinds of administrators that perhaps do not exist but typify extreme positions. First, we have the administrator whose behavior can best be summed under the phrase "shoot from the hip." He has been characterized as running the school system from his hip pocket. At the other extreme we have the administrator who is forever laying out all possible alternatives in every situation and never gets to the point where any action is taken. This is the "watch and wait" posture of the man who always needs more information. In the terminology of this paper, these two types of behavior are considered tactics as contrasted to strategy for neither has a plan.

Evaluation Strategy

Strategy is an overall plan designed to achieve a goal. Many situations do not call for the application of the strategy. The kinds of situations where strategies are important-in fact these days imperative-are those that require decisions across successive periods of time. For example, a strategy has the relationship of a game plan in football to the tactic of a specific play for a "third down-one yard to go" situation.

The second condition necessary for developing a strategy has to do with uncertainty. Today it is quite apparent that uncertainty is the rule rather than the exception. For this reason, it is necessary for educational administrators to develop a strategy. If we were certain about the future, we would not need a strategy--we would just need a decision. Perhaps the uncertainty principle can be best summed up as a series of "if-then" situations. The strategy governs the tactics.

The last factor to be mentioned in support of the development of a strategy has to do with the decrease in uncertainty over time. Education is that kind of situation which clearly shows a decrease in alternatives over time. The longer a pupil is in the system, the closer he becomes, in terms of possible alternatives, to becoming an outcome and the less chance there is for the educational process to affect his behavior.

To summarize our concept of a strategy we would say that a strategy is necessary when alternatives exist, when a series of decisions that span time have to be made, and when the closer one gets to the end of the system there are fewer alternatives than the number that existed at the time a pupil entered. To the extent that it is not possible to answer questions and provide alternatives over time, it is impossible to formulate strategy in a meaningful sense of the word.

Strategy and Goals

Since we have defined the conditions which demand a strategy, our next step is to relate the concept to educational goals. At the national level the place of strategy is that of describing an overall plan for achieving national goals. Recently our nation dedicated itself to improving educational opportunity for disadvantaged youth. This goal was operationalized by transforming it into two broad strategies. The first consisted of attempts to change the relationship between disadvantaged pupils and the school within the school setting. This strategy is best known as compensatory education. The other thrust was made through the creation of new educational agencies and by involving new departments of the government in the educational system. An example would be the creation of the Head Start program through the Office of Educational Opportunity. In addition, Vista Volunteers, the Job Corps, and Community Action Programs were also initiated.

Today at the national level we are in a position to make new decisions based on the time lapse that has occurred and the evaluation that has been made since the initial programs were placed into operation. An example of a shift in tactics would be placing of the Head Start Program into the Department of Health, Education and Welfare. This change in tactics resulted, we hope, from evidence on the operation of the program since its inception. Thus, the providing of information on the results of programs created to implement a national strategy is viewed in relation to a national goal. This is as it should be and is a part of what we have in mind when we talk about evaluation.

Evaluation Systems

We are now in a position to discuss evaluation as a concept. Evaluation systems are imbedded in educational systems and serve as devices for correcting performance toward a real or desired standard. By being sensitive to deviations from the standard and feeding the deviations back into the system, evaluation is a process of providing information for decision making in education.

At this point you have probably noticed that evaluation systems have replaced evaluation in the context of educational systems. As the word system is being used here, it has certain characteristics. First, a system exists in terms of having physical boundaries and being identifiable. Indeed, a person can perceive it, he can locate it, he can comprehend it. Also, a system is what it is--nothing more, nothing less. By this we mean that a system performs a function and can exist without any relationship to how well it performs the function or how it relates to the world. It is when you add the concept of evaluation that a system begins to have restrictions placed upon it.

A system consists of both men and materials which operate in functional relationships to one another. In other words, the men and materials are interdependent. For

the sake of parsimony, we describe systems in terms of their input, process, and output. In viewing an educational system from a traditional vantage point, a pupil is considered as the input; process is usually viewed as instruction; pupils changed by the process and discharged from the system are the output. An evaluation system serves as the correction device by feeding back into the educational system discrepancies between the actual output and the desired output. It is this feedback provision which is the heart of an evaluation conceptualization. Evaluation, to use a mechanical analogy, is the servo-mechanism for making corrections in the system in order to produce a product that is consistent with the specification of expectation for the product.

This digression into systems concept was made in order to understand the place of an evaluation system in an educational system. Also, it has allowed us to derive certain principles. One, outputs in systems terms are never inadequate; given an input that is satisfactory, the systems that produce these outputs are inadequate. Two, unspecified variations in output are not detectable. In addition, unmeasured variations in output that are not fed back into the system cannot affect the operation of the system. These principles define the role of evaluation. The concept is useful in that it allows us to define and concentrate on process modification withou reference to the exact content and concerns itself with alternatives in functional organization.

Let us again summarize. An evaluation system is in reality a subsystem of an educational system; a subsystem in the sense that it is superimposed upon an educational system to provide information for decisions related to the maintenance and goals of the educational system. Evaluation, when viewed this way, has moved from the posture of determining the worth of A versus B to one that provides information for complex educational systems in light of buildings, investments, maintenance, food services, supplies, personnel, pupils, computers and emerging technology. Evaluation is now in the position of providing information for new conclusions regarding the impact and importance of educatinn.

Educational Outcome

With the background of systems concepts in mind, educational outcomes form a starting point for evaluating our educational programs. We start with the present system in terms of what its products look like, what elements in terms of staff, facilities, and finance entered into the process of explicating the curriculum that produced these products. The curriculum serves as the vehicle for making changes in the input of our system, as well as incorporating change in the structure and relationship of elements over a period of time.

Educational outcomes represent the starting point for any evaluation activity in education. The practical standard for developing a strategy is the present status of the output. By expanding the present status of output to include all interrelated information and placing this information in juxtaposition with ideal situations, standards, past attempts, counterparts from other systems, and lacks or gaps in our measurement, we will be in a position to provide information systematically to decision makers. From a

systems point of view, the traditional conceptualization of outcome as only pupil behavior upon termination is far too limited. This important aspect of outcome will be elaborated next.

Levels of Outcome

By using the same systems reasoning for our conceptualization of outcomes, we can better understand the levels problem in education. The outcome-which is hopefully a behavioral change- in a pupil-teacher interaction has been a focus of concern for many years. When a teacher attempts to move from the level of a specific interaction to one of providing information on the outcome of a unit of material, the levels problem becomes apparent. What are the decision rules? Do I add all positive responses? Do I take off for mistakes? Have I asked for what I wish every pupil to know? At the next level a teacher puts together the information from the units to form a mark for the period. Then the marks for the periods are put together to form a mark for the subject. We could go on to subject combinations for producing a standing within grade within area within state and on and on. Suffice it to say that data aggregation causes a loss in information about the specificity of pupil response potential for given situations.

The point I would like to make about outcomes is simply that from a systems standpoint, the instructional program is imbedded in a staff system, a facilities system, and a financial system, and in reality there are multiple outcomes. Outcomes in education consist of much more than changes in pupil behavior. For we must realize that simultaneous change is also taking place in the other subsystems of our educational system. Indeed, the care and maintenance of our educational system must be based upon evaluation information that specifies and feeds back a wide variety of outcome data. For today's evaluation information becomes tomorrow's management data.

Evaluation Strategy

Since this paper represents an attempt at defining a role for educational outcomes in building an evaluation strategy. An since we have presented a case for multiple levels of outcomes across interrelated subsystems, it is only fair that our conceptualizations of an evaluation strategy be explicated.

The criteria for an evaluation system are more than those of validity and reliability of data. For evaluation is more than measurement. To meet the needs of decision making, evaluation must also meet the criteria of relevance, timeliness, credibility, persuasiveness and efficiency. The evaluation system of the future will be an information system serving decision making.

Scope of an Evaluation

Although they have been previously stated, it is now appropriate to bring together the principles which should guide our thinking in examining education from a systems point of view. For, contrary to what one would expect, given our experience in the physical sciences on the interrelatedness of events, we have traditionally studied the learning

Phenomena in eduation with regard for the restrictions caused by the system's actual operation.

In the proposed evaluation strategy, the goal is to depict the instructional program in terms of all its significant interactions. A systems approach deliberately complicates events to include all components that significantly contribute to the output.

Again, this methodology must be related to levels of decisions as they define the scope of the system depicted and the representation must include all interrelatinnships that impinge on the system at that particular level. The meaning of interrelationships in the previous sentence is equal to "significantly related."

The above statement again points to the conceptual necessity of considering system input as output of other systems and system output as in input for still other systems. Thus, both input and output possess restrictions caused by other systems and change in output caused by alteration of the system under consideration must be viewed in the larger context of other systems.

An example from the work of the Iowa Educational Information Center will help illustrate these principles. Flexible modular scheduling (a device for implementing pupil schedules based upon fifteen minute time modules through the use of a computer) is being introduced into several Iowa high schools.

What was at first blush considered as a way of combining large group-small group instruction and team teaching to better teach subject matter actually turned out to have effects on teacher-administrative, teacher-pupil, teacher-parent, pupil-pupil, administrator-pupil, parent-administrator and school-community relationships.

After several years of false starts and conflict situations, the project is now considered as a human interaction change process rather than as a curricular tool or a budgeting device. We found that flexible scheduling affects the specifications of pupil input characteristics, the use of space, the allocation of staff resources, the development of subject matter content and the interpersonal relationship of the school to the community, in addition to a hoped for "better way of teaching content" - in other words, the installation of flexible scheduling effected systems other than the curriculum system.

Our goal at the Center is to develop the educational program as the vehicle for this new concept of evaluation. A concept based on the provision of information for planning and management of resources. We would like you to join us in this work.